(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 890 432 A1

(12) EUROPEAN PATENT APPLICATION

published in accordance with Art. 158(3) EPC

(43) Date of publication:
13.01.1999 Bulletin 1999/02

(21) Application number: 97939194.3

(22) Date of filing: 05.09.1997

(51) Int. Cl.[6]: B32B 27/36, C08G 81/02, C08J 5/18, B65D 81/24

(86) International application number:
PCT/JP97/03131

(87) International publication number:
WO 98/09813 (12.03.1998 Gazette 1998/10)

(84) Designated Contracting States:
DE FR GB IT NL

(30) Priority: 06.09.1996 JP 257514/96
27.12.1996 JP 359297/96

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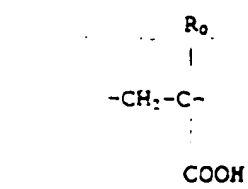
(54) CONTAINER FOR RETORT PACKAGING, RESIN COMPOSITION, AND GAS-BARRIER FILM PREPARED THEREFROM

(57) The present invention provides a container for retort packaging comprising a laminated film having an outermost layer comprising a layer formed of a cross-linked structure containing ester bonds between poly(meth)acrylic acid (A) and a polyalcoholic polymer (B); a resin composition having at least the chemical structures (X), (Y) and (Z) described below, wherein the degree of esterification defined by the equation of (degree of esterification) = c/(b+c+d) is 0.01 or more and 0.5 or less and the degree of ionization defined by the equation of (degree of ionization) = c/(b+c+d) is 0.01 or more and 0.9 or less (wherein b, c and d represent the molar ratios of the carbon - oxygen double bond in the chemical structure of the resin composition; and a gas barrier film comprising the same:

chemical structure (X):



(R_0: H or CH_3)

EP 0 890 432 A1

Printed by Xerox (UK) Business Services
2.16.7/3.6

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of the gas barrier property and the gas barrier function is kept unchanged even when the film makes a contact with hot water. In addition, the gas barrier film according to the present invention can be formed into a laminated film with films comprising other resins, providing toughness and sealing property. The film is suitable as packaging materials for the articles, especially articles being subjected to hot-water treatment after packaging, such as article liable to be denaturated with oxygen gas, infusion solutions, foodstuffs and beverages.

Claims

1. A container for retort packaging comprising a laminated film having an outermost layer comprising a layer formed of a cross-linked structure containing ester bonds between poly(meth)acrylic acid (A) and a polyalcoholic polymer (B).

2. A container for retort packaging according to Claim 1, wherein the cross-linked structure is composed of (A) and (B) with a mass ratio of 99 : 1 to 20 : 80.

3. A container for retort packaging according to Claim 1 or Claim 2, wherein the polyalcoholic polymer (B) is a saccharide or polyvinyl alcohol.

4. A container for retort packaging according to Claim 3, wherein the saccharide is starch.

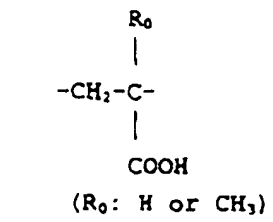
5. A packaged article packed and packaged in the container for retort packaging according to Claim 1.

6. A retort method characterized by treating the container for retort packaging according to Claim 1 in water containing a metal (C).

7. A retort method characterized by treating the packaged article according to Claim 5 in water containing a metal (C).

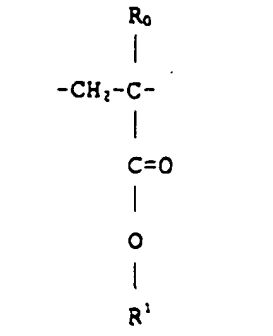
8. A resin composition having at least the chemical structures (X), (Y) and (Z) described below, wherein the degree of esterification defined by the equation (1) is 0.01 or more and 0.5 or less and the degree of ionization defined by the equation (2) is 0.01 or more and 0.9 or less:

chemical structure (X):



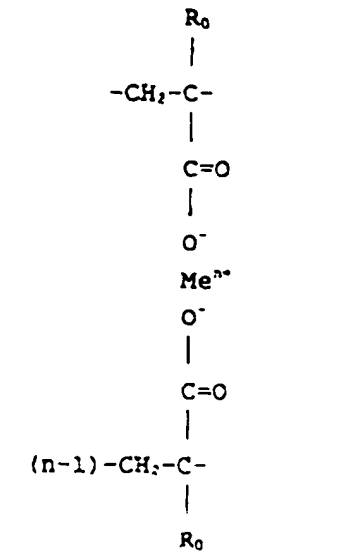
(R_0: H or CH_3)

chemical structure (Y):



(R_0: H or CH_3, R^1: a structure derived from a polyalcoholic polymer)

chemical structure (Z):



(R_0 is H or CH_3 that may be the same or different. Me^{n+} is a n-valent metal ion and n is 1 to 3)

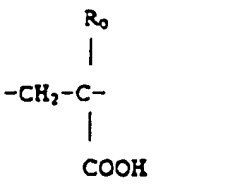
$$\text{Degree of esterification} = c/(b+c+d) \quad (1)$$

$$\text{Degree of ionization} = d/(b+c+d) \quad (2)$$

(wherein b, c and d represent molar ratios of carbon - oxygen double bonds in the chemical structures (X), (Y) and (Z) of the resin composition)

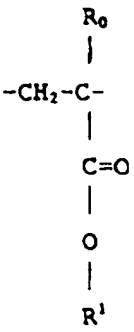
9. A resin composition comprising a reaction product of poly(meth)acrylic acid (A), a polyalcoholic polymer (B) and a metal (C) as starting materials, wherein said resin composition has at least the chemical structures (X), (Y) and (Z) described below, the degree of esterification defined by the equation (1) is 0.01 or more and 0.5 or less and the degree of ionization defined by the equation (2) is 0.01 or more and 0.9 or less:

chemical structure (X):



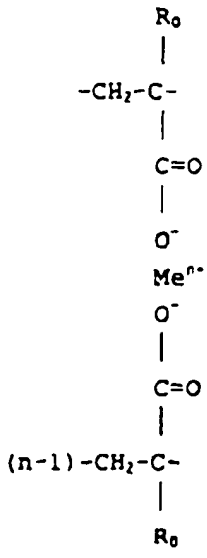
(R_0: H or CH_3)

chemical structure (Y):



(R_0: H or CH_3, R^1: a structure derived from polyalcoholic polymer)

chemical structure (Z)



(R_0 is H or CH_3 that may be the same or different, Me^{n+} is a n-valent metal ion wherein n is 1 to 3)

$$\text{Degree of esterification} = c/(b+c+d) \quad (1)$$

$$\text{Degree of ionization} = d/(b+c+d) \quad (2)$$

(wherein b, c and d represent molar ratios of the carbon - oxygen double bonds in the chemical structures (X), (Y) and (Z) of the resin composition)

10. A resin composition according to Claim 9, wherein the polyalcoholic polymer (B) is polyvinyl alcohol or a saccharide.

11. A resin composition according to Claim 10, wherein the saccharide is starch.

12. A resin composition according to Claim 9, wherein the metal (C) is at least one kind of metal selected from a group comprising alkali metals and alkali earth metals.

13. A resin composition according to Claim 12, wherein the metal (C) is magnesium or calcium.

14. A gas barrier film comprising the resin composition according to Claim 9.

15. A gas barrier film according to Claim 14, wherein the oxygen permeation coefficient measured at a relative humidity (RH) of 80% at 30 °C is 1.52×10^{-19} mol/m · s · Pa (3.40×10^{-13} cm^3(STP) · cm/m^2 · s · Pa) or less.

16. A gas barrier laminated film having at least one layer of the gas barrier film according to Claim 14.

17. A gas barrier laminated film according to Claim 16 for use in retort packaging.

18. A method for producing the gas barrier film according to Claim 14 comprising the steps of:

(1) forming a film-like article mainly composed of poly(meth)acrylic acid (A) and a polyalcoholic polymer (B);
(2) subjecting said film-like article to heat treatment; and
(3) subjecting the film-like article after heat treatment to an immersion treatment in a medium containing a metal (C).

19. A gas barrier film according to Claim 18, wherein the oxygen permeation coefficient measured at a relative humidity (RH) of 80% at 30 °C is 1.52×10^{-19} mol/m · s · Pa (3.40×10^{-13} cm^3(STP) · cm/m^2 · s · Pa) or less.